

# Caries Research

Journal founded 1967 by Y. Ericsson; edited 1970–1987 by K.G. König; 1987–1994 by J.M. ten Cate

Caries Research is the Journal of the European Organization for Caries Research (ORCA), an organization founded in 1953 by Dr. Hans R. Held, Geneva, Switzerland to promote research into dental caries and related matters.

## Editor-in-Chief

J. Tenovouo, Turku

## Associate Editors

C. Robinson, Leeds  
J.W. Stamm, Chapel Hill, N.C.

## Board of ORCA 1994/95

*President:*  
D.A.M. Geddes, Glasgow  
*Vice-president:*  
D.M. O'Mullane, Cork  
*Co-president:*  
C. van Loveren, Amsterdam  
*Treasurer:*  
G. Embery, Cardiff  
*Secretary-General:*  
C.M. Pine, Dundee  
*Assistant Secretary:*  
B. Nyvad, Aarhus

## Advisory Council 1994/95

B. Angmar-Månsson, Huddinge  
J.J. ten Bosch, Groningen  
R.M. Duckworth, Wirral  
M.S. Duggal, Leeds  
H. Duschner, Mainz  
I.K. Paunio, Helsinki  
N.B. Pitts, Dundee  
J.J. de Soet, Amsterdam  
L. Stösser, Erfurt  
H. Whelton, Cork

KARGER

.....  
S. Karger  
Medical and Scientific Publishers  
Basel · Freiburg · Paris · London  
New York · New Delhi · Bangkok  
Singapore · Tokyo · Sydney

.....  
Drug Dosage  
The authors and the publisher have exerted every effort to ensure that drug selection and dosage set forth in this text are in accord with current recommendations and practice at the time of publication. However, in view of ongoing research, changes in government regulations, and the constant flow of information relating to drug therapy and drug reactions, the reader is urged to check the package insert for each drug for any change in indications and dosage and for added warnings and precautions. This is particularly important when the recommended agent is a new and/or infrequently employed drug.

.....  
All rights reserved.  
No part of this publication may be translated into other languages, reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, microcopying, or by any information storage and retrieval system, without permission in writing from the publisher or, in the case of photocopying, direct payment of a specified fee to the Copyright Clearance Center (see 'Information for Readers and Subscribers').

© Copyright 1995 by S. Karger AG,  
P.O. Box, CH-4009 Basel (Switzerland)  
Printed in Switzerland on acid-free paper by  
Reinhardt Druck Basel

# Contents Vol. 29, 1995

## No. 1

Editorial	1
Tenovuo J	

## Original Papers

A New Method for in vivo Quantification of Changes in Initial Enamel Caries with Laser Fluorescence	2
de Josselin de Jong E, Sundström F, Westerling H, Tranæus S, ten Bosch J, Angmar-Månsson B	
Propagation of Light through Human Dental Enamel and Dentine	8
Vaarkamp J, ten Bosch JJ, Verdonschot EH	
Effect of Air-Drying on Demineralized and on Sound Coronal Human Dentine: A Study on Density and on Lesion Shrinkage	14
Arends J, Ruben J	
Fluorosis-Like Effects of Acidosis, but Not $\text{NH}_4^+$ , on Rat Incisor Enamel	20
Whitford GM, Angmar-Månsson B	
Urinary Fluoride Excretion in Children with Low Fluoride Intake or Consuming Fluoridated Salt	26
Marthaler TM, Steiner M, Menghini G, De Crousaz P	
Urinary Fluoride Excretion in Jamaica in Relation to Fluoridated Salt	35
Warpeha RA, Marthaler TM	
Cariogenic Bacteria in a Longitudinal Study of Approximal Caries	42
Sigurjóns H, Magnúsdóttir MO, Holbrook WP	
A Comparison of the Microbial Flora in Carious Dentine of Clinically Detectable and Undetectable Occlusal Lesions	46
de Soet JJ, Weerheijm KL, van Amerongen WE, de Graaff J	
Fluoride Concentration, Mutans Streptococci and Lactobacilli in Plaque from Old Glass Ionomer Fillings	50
Forss H, Näse L, Seppä L	
Effects of Sugar Restriction on <i>Streptococcus mutans</i> and <i>Streptococcus sobrinus</i> in Saliva and Dental Plaque	54
Wennerholm K, Birkhed D, Emilson CG	
Comparison of the Efficacy of 40% Chlorhexidine Varnish and 1% Chlorhexidine-Fluoride Gel in Decreasing the Level of Salivary Mutans Streptococci	62
Pienihäkkinen K, Söderling E, Ostela I, Leskelä I, Tenovuo J	
Potential Cariogenicity of Starches and Fruits as Assessed by the Plaque-Sampling Method and an Intraoral Cariogenicity Test	68
Pollard MA	
Effect of Addition of 0.103% Citrate to a Blackcurrant Drink on Plaque pH in vivo	75
Duggal MS, Tahmassebi JF, Pollard MA	
Acknowledgment to Referees	80

## No. 2

## Original Papers

In vivo Diagnosis of Fissure Caries Using a New Electrical Resistance Monitor	81
Lussi A, Firestone A, Schoenberg V, Hotz P, Stich H	
Electrical Conductance and Electrode Area on Sound Smooth Enamel in Extracted Teeth	88
Huysmans MCDNJM, Verdonschot EH, Rondel P	
Electrical Conductance of Fissure Enamel in Recently Erupted Molar Teeth as Related to Caries Status	94
Ie YL, Verdonschot EH, Schaeken MJM, van't Hof MA	
Validity of Electrical Conductance Measurements in Evaluating the Marginal Integrity of Sealant Restorations	100
Verdonschot EH, Rondel P, Huysmans MCDNJM	
Contact Microradiography of Dentine under Wet Conditions to Prevent Lesion Shrinkage	107
van Strijp AJP, Buijs MJ, ten Cate JM	
Mineral Content of the Dentine Remaining after Chemo-mechanical Caries Removal	111
Yip HK, Beeley JA, Stevenson AG	
The Diameter of Dentinal Tubules in Human Coronal Dentine after Demineralization and Air Drying. A Combined Light Microscopy and SEM Study	118
Arends J, Stokroos I, Jongebloed WG, Ruben J	
Structure of Artificial Enamel Lesions after Topical Applications of High-Concentration Sodium Fluoride Solution in vitro	122
Wen HB, Cui FZ, Chen XQ, Wang Q, Li HD	
Stoichiometry of Fluoride Release from Fluorhydroxyapatite during Acid Dissolution	130
Pearce EIF, Guha-Chowdhury N, Iwami Y, Cutress TW	
Dental Enamel Opacities in Three Groups with Varying Levels of Fluoride in Their Drinking Water	137
Ellwood RP, O'Mullane DM	
Effects of Sodium Bicarbonate Dentifrices on the Levels of Cariogenic Bacteria in Human Saliva	143
Legier-Vargas K, Mundorff-Shrestha SA, Featherstone JDB, Gwinner LM	
Salivary Mutans Streptococci and Incidence of Caries in Preschool Children	148
Thibodeau EA, O'Sullivan DM	
Comparison of Selected Microflora of Plaque and Underlying Carious Dentine Associated with Primary Root Caries Lesions	154
Beighton D, Lynch E	
Streptococci and Actinomyces Inhibit Regrowth of <i>Streptococcus mutans</i> on Gnotobiotic Rat Molar Teeth after Chlorhexidine Varnish Treatment	159
van der Hoeven JS, Schaeken MJM	

# No. 3

## Original Papers

A 30-Month Study Investigating the Effect of Adding Triclosan/Copolymer to a Fluoride Dentifrice Hawley, G.M.; Hamilton, F.A.; Worthington, H.V.; Davies, R.M.; Holloway, P.J.; Davies, T.G.H.; Blinkhorn, A.S.	163
Anticaries Effect of Different Amine Fluoride Concentrations in Schoolchildren Rošin-Grget, K.; Linčir, I.	168
Effect of Urea in Sugar-Free Chewing Gums on pH Recovery in Human Dental Plaque Evaluated with Three Different Methods Imfeld, T.; Birkhed, D.; Lingström, P.	172
Effects of Chlorhexidine-Fluoride Mouthrinses on Viability, Acidogenic Potential, and Glycolytic Profile of Established Dental Plaque Giertsen, E.; Scheie, A.Aa.	181
Effect of an Antibacterial Varnish on Mutans Streptococci in Plaque from Enamel Adjacent to Orthodontic Appliances Twetman, S.; Hallgren, A.; Petersson, L.G.	188
Effect of Dentine and Collagen on the Lethal Photosensitization of <i>Streptococcus mutans</i> Burns, T.; Wilson, M.; Pearson, G.J.	192
Detection of Mutans Streptococci in Secondary Carious Lesions Using Immunofluorescent Techniques and Confocal Laser Scanning Microscopy González-Cabezas, C.; Li, Y.; Noblitt, T.W.; Gregory, R.L.; Kafrawy, A.H.; Stookey, G.K.	198
Comparisons of in vitro Root Caries Models Wefel, J.S.; Heilman, J.R.; Jordan, T.H.	204
Influence of Fluoride Applications on Some Physicochemical Surface Properties of Synthetic Hydroxyapatite and Human Dental Enamel and Its Consequences for Protein Adsorption Kambara, M.; Norde, W.	210
Fluoride Distribution of Rat Molar Cementum in Relation to Age and Fluoride Levels in the Drinking Water Kondo, K.; Nakagaki, H.; Kato, K.; Narita, N.; Ito, T.; Kanayama, T.; Robinson, C.	218
Formation of Phosphate-Containing Calcium Fluoride at the Expense of Enamel, Hydroxyapatite and Fluorapatite Christoffersen, J.; Christoffersen, M.R.; Arends, J.; Leonardsen, E.S.	223
The Influence of Air-Drying on Hyper-Re mineralization of Demineralized Dentine: A Study on Bulk as Well as on Thin Wet Section of Bovine Dentine Inaba, D.; Iijima, Y.; Takagi, O.; Ruben, J.; Arends, J.	231
Investigation of the Effects of Aluminum Mouthrinses on Rat Dental Caries and Plaque Kleber, C.J.; Putt, M.S.	237

# No. 4

## Original Papers

Relationship between External and Histologic Features of Progressive Stages of Caries in the Occlusal Fossa Ekstrand, K.R.; Kuzmina, I.; Bjørndal, L.; Thylstrup, A.	243
Characterization of Fluorosed Human Enamel by Color Reflectance, Ultrastructure, and Elemental Composition Giambro, N.J.; Prostak, K.; Den Besten, P.K.	251
Studies on the Influence of Fluoride on the Equilibrating Calcium Phosphate Phase at a High Enamel/Acid Ratio Pearce, E.I.F.; Larsen, M.J.; Cutress, T.W.	258
Prevalence of Clinically Apparent Recurrent Caries in Scottish Adolescents, and the Influence of Oral Hygiene Practices Chestnutt, I.G.; Jones, P.R.; Jacobson, A.P.M.; Schäfer, F.; Stephen, K.W.	266
Lactobacilli, Mutants Streptococci and Dental Caries: A Longitudinal Study in 2-Year-Old Children up to the Age of 5 Years Roeters, F.J.M.; van der Hoeven, J.S.; Burgersdijk, R.C.W.; Schaeken, M.J.M.	272
Toothbrushing and the Occurrence of Salivary Mutants Streptococci in Children at Day Care Centers Raitio, M.; Möttönen, M.; Uhari, M.	280
Effects of Caffeine Intake during Gestation and Lactation on the Acid Solubility of Enamel in Weanling Rats Schneider, P.E.; Alonzo, G.; Nakamoto, T.; Falster, A.U.; Simmons, W.B.	285
<b>Abstracts</b>	
Abstracts of Papers Presented at the 42nd ORCA Congress Noordwijkerhout, The Netherlands, July 5-8, 1995	
Miscellaneous	291
Microbiology	293
Epidemiology	297
Caries Diagnostic	302
De- and Remineralization / Chemistry of Tooth Tissue	306
Clinical Studies and Calculus	309
Fluoride / Fluorosis	313
Epidemiology and Caries Diagnostic	316
Food and Saliva	320
Author Index	325

## No. 5

### Original Papers

Fluoride Varnish versus Acidulated Phosphate Fluoride Gel: A 3-Year Clinical Trial	327
Seppä, L.; Leppänen, T.; Hausen, H.	
Three-Year Randomized Trial of Professionally Applied Topical Fluoride Gel Comparing Annual and Biannual Applications with/without Prior Prophylaxis	331
Johnston, D.W.; Lewis, D.W.	
Effect of Post-Brushing Water Rinsing on Caries-Like Lesions at Approximal and Buccal Sites	337
Sjögren, K.; Birkhed, D.; Ruben, J.; Arends, J.	
Prediction of Dental Caries Development in 1-Year-Old Children	343
Grindeford, M.; Dahllöf, G.; Nilsson, B.; Modéer, T.	
Prediction of the Erosive Potential of Some Beverages	349
Lussi, A.; Jaeggi, T.; Jaeggi-Schärer, S.	
Radiographic Evaluation of Occlusal Caries: Effect of Training and Experience	355
Lazarchik, D.A.; Firestone, A.R.; Heaven, T.J.; Filler, S.J.; Lussi, A.	
Stereomicroscopy, Film Radiography, Microradiography and Naked-Eye Inspection of Tooth Sections as Validation for Occlusal Caries Diagnosis	359
Hintze, H.; Wenzel, A.; Larsen, M.J.	
Factors Involved in Validity Measurements of Diagnostic Tests for Approximal Caries – A Meta-Analysis	364
van Rijkom, H.M.; Verdonshot, E.H.	
Grey Discolouration and Marginal Fracture for the Diagnosis of Secondary Caries in Molars with Occlusal Amalgam Restorations: An in Vitro Study	371
Rudolphy, M.P.; van Amerongen, J.P.; Penning, Ch.; ten Cate, J.M.	

The Effect of Placing a Clear Pit and Fissure Sealant on the Validity and Reproducibility of Occlusal Caries Diagnosis	377
Deery, C.; Fyffe, H.E.; Nugent, Z.; Nuttall, N.M.; Pitts, N.B.	

Human Root Caries: Microbiota in Plaque Covering Sound, Carious and Arrested Carious Root Surfaces	382
Schüpbach, P.; Osterwalder, V.; Guggenheim, B.	

Sucrose Retention and Colonization by Mutans Streptococci at Different Sites of the Dentition	396
Wennerholm, K.; Emilson, C.G.	

Acid Production by Human Strains of <i>Streptococcus mutans</i> and <i>Streptococcus sobrinus</i>	402
Köhler, B.; Birkhed, D.; Olsson, S.	

Identification and Genetic Characterisation of Melibiose-Negative Isolates of <i>Streptococcus mutans</i>	407
Colby, S.M.; Harrington, D.J.; Russell, R.R.B.	

Interaction of Chlorhexidine with Cytoplasmic Membranes of <i>Streptococcus mutans</i> GS-5	413
Koontongkaew, S.; Jitpukdeebodittra, S.	

Precise Control of the Frequency and Amount of Food Provided for Small Laboratory Animals by a New Electronic Metering Technique, Used to Evaluate the Cariogenic Potential of Chocolate	418
Grenby, T.H.; Mistry, M.	

### Short Communication

Effect of Extrinsic Fluoride Concentration on the Uptake and Release of Fluoride from Two Glass Ionomer Cements	424
Creanor, S.L.; Saunders, W.P.; Carruthers, L.M.C.; Strang, R.; Foye, R.H.	

ORCA Announcements	427
Announcement	429
Acknowledgements	430

---

**No. 6**


---

**Original Papers**

Evaluation of a Fortnightly School-Based Sodium Fluoride Mouthrinse 4 Years following Its Cessation	431	Site Specificity of Citric Acid Retention after an Oral Rinse	467
Holland, T.J.; Whelton, H.; O'Mullane, D.M.; Creedon, P.		Bashir, E.; Gustavsson, A.; Lagerlöf, F.	
Effect of a Modified Toothpaste Technique on Approximal Caries in Preschool Children	435	An Investigation into the Ability of Soft Drinks to Adhere to Enamel	470
Sjögren, K.; Birkhed, D.; Rangmar, B.		Ireland, A.J.; McGuinness, N.; Sherriff, M.	
Plaque Composition, Fluoride Tolerance and Acid Production of Mutans Streptococci before and after the Suspension of the Use of Fluoride Toothpastes	442	The Effect of Sucrose-Containing Chewing-Gum Use on in situ Enamel Lesion Remineralization	477
van Loveren, C.; Buijs, J.F.; Kippuw, N.; ten Cate, J.M.		Hall, A.F.; Creanor, S.L.; Strang, R.; Gilmour, W.H.; Foye, R.H.; Brown, J.; Geddes, D.A.M.	
Caries Development in Children from 2.5 to 3.5 Years of Age: A Longitudinal Study	449	Effect of Lactic Acid and Proteolytic Enzymes on the Release of Organic Matrix Components from Human Root Dentin	483
Grindeford, M.; Dahllöf, G.; Modéer, T.		Dung, S.-Z.; Gregory, R.L.; Li, Y.; Stookey, G.K.	
Evaluation of the in vitro Cariogenic Potential of <i>Streptococcus mutans</i> Strains Isolated from 12-Year-Old Children with Differing Caries Experience	455	Effect of Various Surfactants and Aluminum Solutions on in vitro Acid Dissolution of Dental Enamel	490
Chestnutt, I.G.; MacFarlane, T.W.; Aitchison, T.C.; Stephen, K.W.		Putt, M.S.; Kleber, C.J.	
Do Caries Explorers Transmit Infections within Persons? An Evaluation of Second Molar Caries Onsets	461	The Effect of Milk and kappa Casein on Streptococcal Glucosyltransferase	498
Hujoel, P.P.; Mäkinen, K.K.; Bennett, C.B.; Isokangas, P.J.; Isotupa, K.P.; Pape, H.R., Jr. Lamont, R.J.; DeRouen, T.A.; Davis, S.		Vacca-Smith, A.M.; Bowen, W.H.	
		Adherence of Microorganisms to Rat Salivary Pellicles	507
		Kopec, L.K.; Bowen, W.H.	
		Ultrastructural Change of Enamel Exposed to a Normal Pulsed Nd-YAG Laser	513
		Tagamori, S.; Iwase, T.	
		Author Index Vol. 29, 1995	521
		Subject Index Vol. 29, 1995	523

